

General

Guideline Title

Diagnosis of acute gout: a clinical practice guideline from the American College of Physicians.

Bibliographic Source(s)

Qaseem A, McLean RM, Starkey M, Forciea MA, Clinical Guidelines Committee of the American College of Physicians. Diagnosis of acute gout: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2017 Jan 3;166(1):52-7. [36 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the overall quality of evidence (high, moderate, low, or very low/insufficient) and the strength of the recommendations (strong, weak) are provided at the end of the "Major Recommendations" field.

Recommendation: The American College of Physicians (ACP) recommends that clinicians use synovial fluid analysis when clinical judgment indicates that diagnostic testing is necessary in patients with possible acute gout. (Grade: weak recommendation, low-quality evidence)

Synovial fluid analysis has been the reference standard for gout diagnosis. Misdiagnosis or delayed diagnosis of acute gout may result in unnecessary surgery; hospitalization; delays in adequate treatment, such as antibiotics for septic joints; and unnecessary prescribing of long-term treatment. In the absence of an evidence-based alternative, joint aspiration and synovial fluid analysis should be done if the joint can be aspirated without substantial patient discomfort by an experienced clinician who can minimize the risk for infection; a reliable, accurate source (including a polarizing microscope and a trained operator) is available to detect the presence of urate crystals; the clinical situation is ambiguous; and a significant probability of infection exists.

If these criteria cannot be met, the clinician should either refer the patient to a source that can meet the criteria or use his or her clinical judgment. Clinical judgment is especially appropriate in situations that are less clinically ambiguous and where there is not a significant probability of infection. For example, joint aspiration would not be essential in a patient with podagra, a history of appropriate risk factors (such as age), and no sign of an overlying skin wound. This patient may appropriately be considered to have gout and treated appropriately (see the National Guideline Clearinghouse [NGC] summary of the ACP guideline [Management of acute and recurrent gout](#)). The current evidence is insufficient to recommend a single clinical algorithm for diagnosing gout. However, several promising algorithms showed sensitivities and specificities greater than 80%. Current evidence is insufficient to support the use of dual-energy computed tomography (DECT) or ultrasonography to diagnose acute gout.

Definitions

Grading Strength of Evidence

- High = Further research is unlikely to change confidence in the estimate of effect.
- Moderate = Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
- Low = Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
- Very low/insufficient = Any estimate of effect is very uncertain.

The American College of Physicians' Guideline Grading System*

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

*Adopted from the classification developed by the GRADE (Grading of Recommendations Assessment, Development and Evaluation) workgroup.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Acute gout

Guideline Category

Diagnosis

Clinical Specialty

Family Practice

Internal Medicine

Rheumatology

Intended Users

Advanced Practice Nurses

Health Care Providers

Physician Assistants

Guideline Objective(s)

To provide guidance on diagnosing acute gout in patients with gout symptoms, including joint inflammation

Target Population

Adults with joint inflammation suspected to be gout

Note: This guideline does not apply to adults who have chronic gout that was diagnosed previously by identification of monosodium urate (MSU) and who present with a flare and no suggestion of a concurrent problem, such as a septic joint.

Interventions and Practices Considered

Synovial fluid analysis

Note: Clinical algorithms that incorporate patient signs and symptoms, ultrasonography, dual-energy computed tomography (DECT), computed tomography, and plain radiography were considered but not recommended.

Major Outcomes Considered

- Diagnostic accuracy of clinical signs and symptoms, ultrasound, dual-energy computed tomography (DECT), plain radiographs compared with joint aspiration and synovial fluid analysis
 - Sensitivity/specificity, true positives/true negatives, area under the curve
 - Positive predictive value (PPV), negative predictive value (NPV), positive/negative likelihood ratios (if prevalence known)
- Clinical decision making
 - Additional testing
 - Pharmacologic or dietary management
- Intermediate outcomes
 - Serum urate
 - Synovial fluid crystals
 - Radiographic or ultrasound changes
- Clinical outcomes
 - Pain, joint swelling, and tenderness
 - Patient global assessment
 - Activity limitations
- Adverse effects of tests
 - Pain, infection, radiation exposure
 - Effects of false positive or false negative

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was conducted by the Agency for Healthcare Research

and Quality's (AHRQ's) Southern California Evidence-based Practice Center–RAND Corporation (see the "Availability of Companion Documents" field).

Data Sources and Searches

The reviewers searched, without language restrictions, PubMed, EMBASE, the Cochrane Library, gray literature, and the Web of Science from inception through 29 February 2016 using the word gout combined with the terms for diagnostic methods (*monosodium urate [MSU] crystal analysis, joint aspiration, dual-energy computed tomography [DECT], ultrasound, and x-ray*), clinical signs and symptoms, and outcome measures, without filters specific for the diagnostic tests, as recommended. Supplement Table 1 (see the "Availability of Companion Documents" field) shows the search methodology. The reviewers also obtained relevant references from a search conducted for a simultaneous review on gout management, considered studies suggested by experts, searched ClinicalTrials.gov and the Web of Science for recently completed studies and unpublished or non-peer-reviewed study findings, and contacted manufacturers of equipment and laboratory test kits used to diagnose gout for unpublished data specific to their use for gout diagnosis.

Study Selection

Titles and abstracts identified by the literature searches were screened by 2 reviewers, who independently conducted a full-text review of all selections to exclude articles that reported only on the incidence or prevalence, risk factors, or treatment of gout; included persons younger than 18 years; provided no usable data (sensitivities and specificities or data that could be used to calculate them); reported the same data as another article; enrolled only participants with established gout diagnoses; or did not clearly indicate the use of a recognized diagnostic standard. If necessary, disagreements regarding inclusion at the full-text stage were reconciled with the project leader's input. The reviewers included original prospective and cross-sectional studies that assessed the accuracy (sensitivity and specificity) or safety of tests used to diagnose gout in persons with no prior definitive gout diagnosis who presented with joint inflammation, and in which the reference standard was MSU analysis or a combination of MSU analysis, American Rheumatism Association (ARA) (now the American College of Rheumatology [ACR]) criteria for gout diagnosis, and tests to confirm or rule out other causes of inflammatory arthritis. Studies that enrolled patients with asymptomatic hyperuricemia were excluded. To assess safety, reviewers also included case reports and case series. Detailed inclusion and exclusion criteria are presented in the AHRQ report (see the "Availability of Companion Documents" field).

Number of Source Documents

The searches identified 4,661 citations (see the literature flow diagram in the systematic review [see the "Availability of Companion Documents" field]). Twenty-two total articles addressing the accuracy (n = 21) or safety (n = 3) of various diagnostic methods were included for evidence synthesis.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Grading Strength of Evidence

- High = Further research is unlikely to change confidence in the estimate of effect.
- Moderate = Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
- Low = Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
- Very low/insufficient = Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was conducted by the Agency for Healthcare Research and Quality's (AHRQ's) Southern California Evidence-based Practice Center–RAND Corporation (see the "Availability of Companion Documents" field).

Data Extraction and Quality Assessment

Two reviewers abstracted study-level details from articles accepted for inclusion. Outcomes (sensitivity, specificity, and positive and negative predictive value [PPV and NPV]) were singly abstracted and verified by another reviewer. Risk of bias (study quality) of each included study was assessed independently by 2 reviewers using the QUADAS-2 (Revised Quality Assessment of Diagnostic Accuracy Studies) tool. Supplement Table 2 (see the "Availability of Companion Documents" field) includes the results of the quality assessment. Disagreements regarding study details were reconciled by group discussion, and those related to study quality were mediated by the project leader.

Data Synthesis and Analysis

The reviewers organized the narrative descriptions of evidence, which focused on study quality, settings, and findings, according to categories of tests, as well as chronologically. If several studies compared similar tests with the same reference standard, reviewers used bivariate metaregression to pool studies. As a group, the reviewers assessed the overall strength of evidence (SOE) for each major comparison and outcome as high, moderate, low, or insufficient using guidance suggested by the Effective Health Care Program.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline is based on a systematic evidence review and an evidence report sponsored by AHRQ (see the "Availability of Companion Documents" field) that addressed the following key questions:

Key Question 1

- a. What is the accuracy of clinical signs and symptoms and other diagnostic tests (such as serum urate, ultrasonography, computed tomography, dual-energy computed tomography [DECT], and plain radiography), alone or in combination, compared with synovial fluid analysis in diagnosing acute gouty arthritis, and how does the accuracy affect clinical decision making, clinical outcomes and complications, and patient-centered outcomes?
- b. How does the diagnostic accuracy of clinical signs and symptoms and other tests vary by affected joint site and number of joints?
- c. Does the accuracy of diagnostic tests for gout vary by duration of symptoms (that is, time from the beginning of a flare)?
- d. Does the accuracy of synovial fluid aspiration and crystal analysis differ by the type of practitioner who is performing the aspiration or the crystal analysis?

Key Question 2

- a. What are the adverse effects (including pain, infection at the aspiration site, radiation exposure) or harms (related to false-positive, false-negative, and indeterminate results) associated with tests used to diagnose gout?

Grading the Evidence and Developing Recommendations

This guideline was developed by the American College of Physicians (ACP) Clinical Guidelines Committee (CGC) according to the ACP guideline development process, details of which may be found in the methods paper (see the "Availability of Companion Documents" field). The CGC used the evidence tables in the systematic review and AHRQ report (see the "Availability of Companion Documents" field) when reporting the evidence and graded the recommendations by using the ACP system, which is based on the GRADE (Grading of Recommendations Assessment, Development and Evaluation) method (see the "Rating Scheme for the Strength of the Recommendations" field).

Rating Scheme for the Strength of the Recommendations

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

*Adopted from the classification developed by the GRADE (Grading of Recommendations Assessment, Development and Evaluation) workgroup.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

The guideline was peer reviewed through the journal and posted online for comments from American College of Physicians (ACP) Governors and Regents. All comments were read and carefully considered by the authors, and important issues were also discussed by the Clinical Guidelines Committee (CGC).

This guideline was approved by the ACP Board of Regents on November 7, 2015.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Accurate diagnosis of gout, leading to appropriate treatment

Potential Harms

- Synovial fluid aspiration for monosodium urate (MSU) analysis is associated with nonserious adverse events, such as mild postprocedure pain.
- Misdiagnosis or delayed diagnosis, leading to inadequate or inappropriate treatment

Qualifying Statements

Qualifying Statements

- Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to override clinicians' judgment. All American College of Physicians (ACP) clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication or once an update has been issued.
- The authors of this article are responsible for its contents, including any clinical or treatment recommendations.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Qaseem A, McLean RM, Starkey M, Forciea MA, Clinical Guidelines Committee of the American College of Physicians. Diagnosis of acute gout: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2017 Jan 3;166(1):52-7. [36 references] [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2017 Jan 3

Guideline Developer(s)

American College of Physicians - Medical Specialty Society

Source(s) of Funding

Financial support for the development of this guideline comes exclusively from the American College of Physicians (ACP) operating budget.

Guideline Committee

Clinical Guidelines Committee of the American College of Physicians

Composition of Group That Authored the Guideline

Primary Authors: Amir Qaseem, MD, PhD, MHA; Robert M. McLean, MD; Melissa Starkey, PhD; Mary Ann Forciea, MD

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Financial Disclosures/Conflicts of Interest

Dr. Barry reports grants and personal fees from Informed Medical Decisions Foundation and Healthwise, outside the submitted work. Dr. Boyd reports royalties from UpToDate, outside the submitted work. Dr. Manaker reports personal fees from work as a grand rounds speaker, lecturer, consultant, and expert witness on documentation, coding, billing, and reimbursement to hospitals, physicians, departments, practice groups, professional societies, insurers, and attorneys (defense, plaintiff "qui tam," U.S. attorneys general, and the Office of the Inspector General); personal fees from work as an expert witness in workers' compensation and medical negligence; dividend income from stock held by his spouse in Pfizer and Johnson and Johnson; and meal and travel expenses for serving on the Centers for Medicare & Medicaid Services (CMS) Hospital Outpatient Panel, the American Medical Association/Specialty Society Relative Value Unit Update Committee, and the Board of Directors of CHEST Enterprises, a subsidiary of the American College of Chest Physicians. Authors not named here have disclosed no conflicts of interest. Authors followed the policy regarding conflicts of interest described at www.annals.org/aim/article/745942 . Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M16-0569 . All financial and intellectual disclosures of interest were declared, and potential conflicts were discussed and managed. No Clinical Guidelines Committee (CGC) members were recused from voting on this guideline due to conflicts. A record of disclosures and management of conflicts of interest is kept for each CGC meeting and conference call and can be viewed at www.acponline.org/about-acp/who-we-are/leadership/committees-boards-councils/clinical-guidelines-committee/disclosure-of-interests-for-clinical-guidelines-committee .

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the [Annals of Internal Medicine Web site](#) .

Availability of Companion Documents

The following are available:

- Newberry SJ, FitzGerald JD, Motala A, Booth M, Maglione MA, Han D, Tariq A, O'Hanlon CE, Shanman R, Dudley W, Shekelle PG. Diagnosis of gout: a systematic review in support of an American College of Physicians clinical practice guideline. *Ann Intern Med.* 2017 Jan 3;166(1):27-36. Available from the [Annals of Internal Medicine Web site](#) .
- Diagnosis of gout: a systematic review in support of an American College of Physicians clinical practice guideline. Supplement. 2017. 29 p. Available from the [Annals of Internal Medicine Web site](#) .
- Newberry SJ, FitzGerald J, Maglione MA, O'Hanlon CE, Han D, Booth M, Motala, A, Tariq A, Dudley W, Shanman R, Shekelle PG. Diagnosis of Gout. Rockville (MD): Agency for Healthcare Research and Quality (US); 2016 Feb. 150 p. (Comparative Effectiveness Reviews, No. 158.) Available from the [Agency for Healthcare Research and Quality \(AHRQ\) Web site](#) .
- Qaseem A, Snow V, Owens DK, Shekelle P. The development of clinical practice guidelines and guidance statements of the American College of Physicians: summary of methods. *Ann Intern Med.* 2010 Aug 3;153(3):194-9. Available from the [Annals of Internal Medicine Web site](#) .

Patient Resources

The following is available:

- Diagnosis and management of gout: clinical practice guidelines from the American College of Physicians. Summaries for patients. *Ann Intern Med.* 2017 Jan 3;166(1):I-16. Available from the [Annals of Internal Medicine Web site.](#)

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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